

SAN FRANCISCO NAVAL SHIPYARD
SAN FRANCISCO 24, CALIFORNIA

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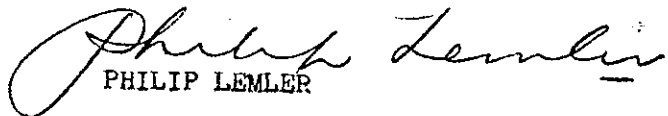
From: Commander, Naval Shipyard, San Francisco
To: Chief of the Bureau of Ships (Code 400-689)
Chief of the Bureau of Medicine and Surgery (Code 74)
Chief of the Bureau of Aeronautics (Code AE45)
Chief of the Bureau of Yards and Docks (Code D4)

Subj: Monthly Progress Report of Radiation Laboratory for Month
of January 1948; Submission of

Ref: (a) BuShips-BuMed SECRET ltr S(99) BuShips ser. 005800,
BuMed ser. 005001 of 18 February 1947

Encl: (A) Radiation Laboratory Administrative Progress Report
for Month of January 1948
(B) Radiation Laboratory Technical Progress Report
for Month of January 1948
(C) Radiation Laboratory Radiological Safety Progress
Report of January 1948

1. Enclosures (A), (B) and (C) reporting progress of Radiation Laboratory
for the month of January 1948 are submitted herewith in compliance with
reference (a).


PHILIP LEMLER

7-11)

Radiation Laboratory Administrative Progress Report for Month of January 1948

A. PERSONNEL

1. The following non-professional personnel were added to the Laboratory rolls during the month:

Miss Rose Mary Stephens, Technical Secretary CAF-5
Mr. M. J. Boone, Engineering Aide (Electronics SP-8)
Mr. P. N. Peterson, Engineering Aide (Electronics SP-8)

2. The following non-professional positions were allocated to the Laboratory during the month:

SP-8 Laboratory Mechanic P.D. No. 4935

3. The following additional professional position was allocated during the month:

P-4 Chemist P. D. No. 4929

Other data regarding professional personnel are included in enclosure (B).

B. FACILITIES AND FUNDS

1. Preparatory to movement of the administrative spaces to the north wing of Bldg. 520 (Dental Clinic) plans and estimates for necessary alterations to the facilities in the Dental Clinic for security purposes, and extension of the existing fence to include that portion of the north wing of Bldg. 520 as required have been submitted to the Public Works Department. Upon completion of the plans and estimates necessary, job orders will be issued and the work is expected to commence early in February. The only alterations necessary are those involved with relocation of one head, installation of three security doors and extension of the present fence enclosing Bldg. 506 to Bldg. 520.

2. In accordance with arrangements made with the Public Works Department, general layout plans for the various floors of Bldg. 351 were completed in their first draft form and preparations made to submit the final desired layout to Public Works for architectural study. It is anticipated that some changes in general layouts to conform to the architectural features of Bldg. 351 may be necessary. Upon completion of such changes as are required for this reason, study will commence on required equipment and facilities layouts within the spaces indicated. Meanwhile, a policy is being established of sending certain key personnel of the Radiation Laboratory to attend conferences sponsored by the Atomic Energy Commission and by several of its subsidiary activities to become acquainted with the latest information available and to discuss problems concerning new radiation laboratory design. It is also anticipated that it will be necessary in the near future to have several personnel from the Public Works Department in the shipyard cleared for access to AEC "restricted data" and for visits to AEC sites in order to become sufficiently familiar with the details of proper radioactivity laboratory designs to enable them to complete successfully the plans for Bldg. 351.

3. A project in the amount of \$50,000 for radiological research was allocated to the laboratory by the Bureau of Medicine and Surgery. The object classification on the project was designated as 079 which would limit expenditures to contractual services only. Representations have been made to the Bureau of Medicine and Surgery requesting that the object classification of these funds be altered to permit utilization for procurement and installation of equipment as well as for miscellaneous labor and material incident to the establishment and operation of the laboratory. Verbal information received through the Bureau of Medicine and Surgery Projects Officer indicates that this request is being favorably considered and official notification of authority to expend the funds as desired can be expected in the near future.

4. A detailed plan of projected alterations required in Bldgs. 506 & 507 in order to complete the temporary facilities considered necessary for operation of the laboratory until such time as Bldg. 351 can be occupied was completed during the month. The results of this study were utilized as a basis for a time schedule of facilities availability up to 15 May 1948. It is anticipated that completion of the few remaining alterations indicated will complete the necessary facilities required until work in Bldg. 351 can be completed. Coincident with this study a survey was made as to the available space for scientific and administrative personnel to carry out the assigned mission of the laboratory until Bldg. 351 can be occupied. Results of this study indicated that facilities can be made available in accordance with present plans for all of the personnel who are considered essential for prosecution of the immediate program. These data were utilized to establish the tentative personnel ceiling requirements for the laboratory until 1 July 1948. It is anticipated, however, that because of the shortage of the required type of personnel it probably will not be possible to realize the completion of the personnel recruitment program as set forth in the study until some time in fiscal 1950.

C. SECURITY

1. Atomic Energy Commission clearances for Miss Inez C. O'Brien, acting chief of the Technical Information and Materials Division, and for Miss Rose Mary Stephens, secretary to the Technical Director, have been transferred to this laboratory through the Berkeley Area Manager of the Atomic Energy Commission.

2. All necessary security measures incident to the receipt and handling of fissionable materials and fission products have been completed in the laboratory. The Atomic Energy Commission Area Manager has been advised that the laboratory is now ready to receive the materials requested and delivery is anticipated in the near future.

3. Very satisfactory working arrangements with regard to transfer of restricted data documents as well as MDDC reports have now been established through the Berkeley Area Manager of the Atomic Energy Commission with the Information and Materials Control Branch at Oak Ridge. During the month, Miss Inez O'Brien, acting chief of the Technical Information and Materials Division of the laboratory, visited the Atomic Energy Commission in Washington, D. C., and Oak Ridge, Tennessee, in order to become familiarized with the latest procedures for handling

AEC restricted data documents and for processing of requests. In the course of her visit, Miss O'Brien arranged for the acquisition of certain additional information which is essential to the proper establishment of the files at the Radiation Laboratory and also arranged for the furnishing of necessary index cards to the laboratory for maintaining necessary file data on the documents. Tentative arrangements were also made for ultimate transfer of documents directly from Oak Ridge to the Radiation Laboratory, the requests still being processed and screened by the Berkeley Area Manager, however.

4. Necessary arrangements were commenced during the month for procurement of special identification cards for all personnel attached to the Radiation Laboratory and also for combination identification badge and film badge holders to be utilized by all personnel. It is anticipated that the new badges and badge holders will be delivered some time in March 1948 and upon receipt of these items, it will be possible to establish the desired optimum in laboratory security and personnel protection from radiation hazards.

D. CONSULTANTS AND CONTACTS

1. Dr. L. W. Kinsell and Dr. Sheldon Margan of the Metabolic Research Unit at Oak Knoll Naval Hospital, Oakland, California, visited the Radiation Laboratory to discuss the possibility of obtaining the cooperation of the laboratory in making counts on radioactive sulphur being utilized in the treatment of individuals at Oak Knoll under an ONR contract. Satisfactory arrangements were made whereby the Radiation Laboratory will assist the Metabolic Research Unit in this work as required.

2. On 8 January Lt(jg) H. W. Mastermann, USN, from the Staff of ComFleetAir, Alameda, visited the laboratory in compliance with a request of the Airborne Coordinating Group, Naval Research Laboratory, Washington, D.C., to determine the prospective duties and qualifications for an officer to be assigned to the Radiation Laboratory as the Bureau of Aeronautics Projects Officer. Lt. Mastermann was provided with all of the necessary data which were incorporated in a field report dated 9 January and forwarded by Commander Fleet AirAlameda to the Commanding Officer Airborne Coordinating Group Naval Research Laboratory, Washington, D.C., on 12 January.

3. Captain D. F. Kimbel, USA, reported to the laboratory on temporary additional duty for the period of 12-16 January. Captain Kimbel is assigned to an Army Special Operations Group which is working through Los Alamos and Sandia in the development of practical field applications in radiological safety. Problems of joint interest to the Radiation Laboratory and Captain Kimbel's group were discussed in some detail and arrangements were made for future liaison in connection with field tests based on recommendations developed as the results of the investigation at the laboratory.

4. Dr. W. H. Sullivan was assigned temporary duty at the Radiation Laboratory during the period 14-26 January. Dr. Sullivan is the Technical Director of the Radiation Laboratory, but during the period mentioned was maintaining headquarters in the Bureau of Ships at Washington. During Dr. Sullivan's stay in this period, many questions of policy with regard to the laboratory's program, personnel, facilities and funds were discussed in some detail and arrangements were made for full prosecution of the technical program under his direction upon his assumption of headquarters at San Francisco, on or about 2 February 1948.

5. Commander H. H. Fox, USN, of the Bureau of Ships Code 336, visited the laboratory on 21 January to become familiarized with the facilities, personnel and program. The general program was discussed at some length with Commander Fox as well as the plans for future expansion, organization and funds. Particular emphasis was given in the course of the discussion to the contamination and decontamination testing program and possible future uses of electrolytic descaling processes for application to decontamination.

6. Dr. J. P. Jordan of the General Electric Company, visited the laboratory during the period 22-23 January, and Mr. A. Lovoff of the Bureau of Ships Code 947 during the period 22-26 January. Dr. Jordan and Mr. Lovoff were particularly concerned with the laboratory's instrument evaluation program. The general program, facilities personnel and equipment requirements were discussed in some detail. Mr. Lovoff indicated the general nature and scope of the Bureau's desires with respect to the laboratory's radiac instrument evaluation program, and arrangements were made for close liaison with Code 947, General Electric Company, and other manufacturers who are developing new types of instruments. Arrangements were also made during the visit for Mr. R. H. Pullen to visit Code 947 to discuss the matters further. Prospective plans were laid also for visits by some of the laboratory personnel to the General Electric Company at Schenectady for familiarization with their instrument research program.

Radiation Laboratory Technical Progress Report for Month of January 1948.

A. FACILITIES

1. Drawings for the first and second floors of Bldg. 351 have been completed and approved by the laboratory staff and submitted to the Public Works Department for re-drafting into formal contract plans and building specifications. The laboratory drawings for the third, fourth and mezzanine floors are continuing and are to be completed by about 1 March. Present details which are incorporated in the plans include the location of partitions, hoods, sinks, work benches, etc. Special considerations to be submitted at a future date include the determination of preferred available materials for the bench surfaces, partitions, hoods, etc., which will resist contamination and yet provide satisfactory structural characteristics. To this end, various members of the laboratory have been designated to attend seminars at certain AEC establishments and universities where the subjects for discussion are those of laboratory design and operating problems. The Laboratory Design Conference at the Argonne National Laboratory, Chicago, Illinois, January 15 and 16, 1948 was attended by laboratory representatives. The agenda was as follows:

- I. The Feasibility of Radiant Heating - P. B. Gordon, Consultant, Argonne National Laboratory
- II. Ventilation Problems - J. P. Fitzpatrick, Argonne National Laboratory
- III. Tolerance Activity Levels in Air - J. W. Healy, Hanford Engineer Works
- IV. Duct Materials - L. G. Stang, Brookhaven National Laboratory

The meeting was organized and called by Drs. H. L. Hull (Argonne National Laboratory) and E. R. Jette (Los Alamos Laboratory).

The fact that Bldg. 351 is a multiple-storied building and will require specially designed sewage and fume disposal arrangements offers in itself many complications which are not part of common experience within the bulk of AEC establishments which have otherwise similar problems. It is also considered that the difficult problem of providing adequate ventilation and air conditioning will require thorough investigation and possibly the employment of certain consultants in this field.

According to the recent information obtained by the Shop Superintendent present occupants of Bldg. 351 will vacate about 12 March. It is estimated that completion of the entire conversion project preparatory to final occupancy by the laboratory will be approximately twelve months from the date of commencing work.

2. The alterations to Bldg. 506 have now provided fourteen laboratory working spaces, two counting spaces, and a balance room. These facilities are now occupied and will be in full use subsequent to the final operational tests of vacuum and compressed air equipment now being conducted. The distilled water system has not been installed as yet but existing equipment on hand will provide

for current needs. New alterations to Bldg. 506 to provide for contamination-decontamination studies have been assigned highest priority by the Public Works Department and purchase vouchers for procurement of necessary materials and equipment are being processed. It is considered that the facilities available in Bldg. 506 upon completion of the "hot lab" will provide sufficient laboratory space until such time as Bldg. 351 will become available.

3. Alterations for Bldg. 507 change house and animal quarters are completed except for the operational check of the air conditioning equipment. This delay on delivery of this equipment hampered the final completion of the animal quarters for a considerable period but has finally arrived and been installed. Other portions of Bldg. 507 have been converted for the use of the Supply Section, Medical Stores, and Radiological Safety Services Group.

B. SCIENTIFIC PERSONNEL

1. During the month scientific personnel reported as follows:

Mr. Stanley W. Mayer	Chemist P-4
Miss Inez C. O'Brien	Chemist P-4

2. Personnel who have accepted employment together with dates on which they will enter on duty are as follows:

Dr. Donald J. Kimmeldorf	P-3 Biologist	15 June
Dr. Claude R. Schwob	P-6 Chemist	15 March
Dr. Norman E. Ballou	P-5 Chemist	1 March
(Tentative) Dr. Maurice C. Fishler	P-6 Biologist	15 June


Dr. Schwob will become head of the Chemistry Division and will, in addition, head up the Basic Chemistry Branch. Dr. Ballou will head up the Radiochemical Procedures Training Branch for training of personnel to work in the "hot" laboratory as well as other places in the laboratory. Dr. Fishler will become head of the Biology Division in June. In the meantime he will act as consultant on organization of the biological research program.

3. One offer of employment is outstanding: that of Mr. Harvey F. Matthiesen as a P-4 Chemist, who would be assigned to head up the routine and control analytical section handling all fission product, heavy metal, and other analyses for the entire laboratory.

4. Under active consideration and at the grades indicated are the following personnel:

Dr. Raymond W. Stoughton	P-6 Chemist
Dr. Lloyd R. Zumwalt	P-6 Chemist
Mr. Gordon C. Bell	P-3 Chemist
Dr. Leo A. Sapirstein	P-5 Biologist
Dr. Eugene Roberts	P-5 Biologist
Miss Ruth Kornblum	P-3 Biologist
Dr. Manuel P. Morales	P-5 Biologist

In addition to the above list there are about 15 or 20 other candidates who are under less active consideration.



C. LABORATORY RESEARCH AND DEVELOPMENT WORK

1. The following projects were completed during the month:

- (a) An analysis of the material and labor requirements for reconditioning of all instruments now on loan to the Radiation Laboratory from AEC has been completed preparatory to the return of these instruments to the AEC when directed by the Bureau. Upon the basis of laboratory estimates, the cost of placing all such instruments in an operable condition will be about \$12,500 for labor and material.
- (b) The necessary equipment for study of the ventilation system aboard the USS CRITTENDEN has been collected together and operational tests completed. The test aboard the ship is scheduled for 10 February. It is desired to obtain duct velocities of the order of 1000 feet per minute so as to exceed the transport velocity of the dust held within the ducts.
- (c) Methods have been developed for measurement of alpha activity of air-borne dust samples by use of the proportional alpha counter. Results so obtained are being checked by chemical separation methods.
- (d) A report of the Laboratory and Field Type Dynamic Tube Test Unit has been completed. This unit as now designed will provide for testing of the following components-

- Mark 1 Model 10 A-10 D high voltage GM tubes
- Mark 15 Model 1F low voltage GM tubes
- Victoreen VX series tubes
- Victoreen V-G mica window tubes
- Victoreen VX-41 chamber amplifier units
- Victoreen type 247 chambers

- (e) An engineering analysis of the following radiation survey instruments has been prepared:

- Victoreen Type 263 Survey Instrument
- Victoreen Type X263 Survey Meter
- Model 300 Proteximeter (Victoreen)
- Type 247 Victoreen Survey Meter
- X325 Counting Rate Meter

The characteristics, operational performance, special features and other data for these instruments were obtained from an electronic maintenance and operational performance standpoint. In addition, the maintenance requirements for the Type 263, X263, 247, Model 300 Proteximeter for operational periods from (1) one to (12) twelve months were included. The data obtained has been made the subject of a special report for the Bureau of Ships and other interested activities. This data is a summation of records and data on all radiation survey instruments which have been reconditioned, or repaired over a six months period and includes actual performance and maintenance records of radiation survey instruments used at the monitoring activities at Pearl Harbor, Puget Sound, and San Francisco.

- (f) Clinical studies of the feces and urine specimens obtained from wild rats captured aboard the target vessels has been completed. Further study of the rats in vitro will follow.

3. Work procees during the month on the following projects:

- (a) The collection of air samples on ex-target ships and on nearby dock areas has continued. Each sample is counted for beta plus gamma and for alpha activity. Recently, separate measurements for natural radioactivity present as decomposition products of radon and thoron have been conducted.
- (b) Plans have been completed for the study of air contamination during burning, welding and wire brushing of contaminated surfaces. These tests will be conducted in special dust research chambers upon the arrival of the necessary Electro-air mat filters which are now on order.
- (c) A comprehensive circuit analysis and an evaluation of operational characteristics of the Victoreen Model 300 Proteximeter and the Victoreen Type 247 survey meter are being studied. This data is to be submitted to the Bureau of Ships for use in connection with development of radiation survey instrument standards. In addition, a complete analysis of the Type X263 counting rate meter is also being studied.
- (d) Sandblasting of the deck, pressure hull above the water line and various critical areas aboard the USS DENTUDA is progressing satisfactorily. The drydocking of this vessel is scheduled for 25 February in order that complete decontamination measures can proceed.
- (e) Final monitor's reports are being processed for the USS CRITTENDEN, USS PARCHE, USS GASCONADE, USS PENSACOLA, USS SALT LAKE CITY, USS HUGHES and USS NEVADA.
- (f) In order to establish firm basis for the oil assay procedure, various samples of uncontaminated and USS INDEPENDENCE contaminated bunker oil have been spiked using radioactive shipboard dust of less than 40 micron size. Extraction methods which involve agitating the oil with aqueous solutions of nitric, oxalic, tartaric, citric acids, and mixtures of hydrochloric and citric acids are being investigated. To date, the first preliminary result shows 100% recovery from oil contaminated with radioactive dust by extraction with 2N HNO₃. Due to the press of time we are extracting the USS SALT LAKE CITY oil in this fashion using 8N HNO₃ prior to obtaining substantiating results.
- (g) Experimentation in connection with alpha scintillation counters is proceeding toward producing a light-opaque but alpha-transparent covering for the phosphor. Attempts with multiple layers of very thin aluminum foil have been found to be unsatisfactory due to the presence of pin holes. Additional trials are being effected. Lack of reproducibility of the counter as a possible result of temperature variation has been investigated and long runs at constant temperatures have been conducted. Results obtained were as reproducible as statistics will allow. Subsequent study wherein the thickness and kind of phosphor have been varied have revealed the true role of the phosphor as the temperature sensitive element.
- (h) Preliminary trials have been conducted for a gamma ray counter using naphthalene as the detector in conjunction with a photomultiplier tube. At liquid air temperatures, radium gammas are readily detected. At room temperature, however, the pulse height falls to general background. The temperature sensitive features of the fluorescing materials is again apparent.
- (i) Experimentation directed toward local production of halogen counters is continuing. Close contact with Naval Research Laboratory has been effected in order to benefit through the exchange of data.

- (j) The major emphasis of the Geiger counter program is being directed toward the investigation of permanent counters. All phases are to be considered including gas leaks, gas absorption, quenching gas characteristics, etc.
- (k) Samples are being received for study in connection with the extremely important contamination-decontamination "disc" program. The radiochemical techniques involved for each of the different materials is undergoing thorough investigation preparatory to the completion of the "hot lab" and inauguration of the program on an intensive laboratory basis involving the use of fission products mixtures, individual isotopes and fissionable materials.
- (l) Counting procedures are becoming more standardized throughout the laboratory in an effort to institute interchangeability of components and ease of correlation of results. Constant geometry sample holders and shelves have been completed by the shipyard. Several Tracerlab castles have been obtained and evaluated. Results indicate that the mechanical arrangement for the tube is satisfactory, but does not allow provision for variation of geometry.
- (m) An investigation of the characteristics of the Scott thin window Geiger tubes for use in counting low energy beta particles is underway. Preliminary results are not particularly encouraging but tests will continue until complete evaluation can be obtained.
- (n) One of the more important problems in the study of inhalation as a route absorption of radioactive materials is that of the dissemination of the material in air. A Binks Spray Nozzle and animal exposure chamber arrangement has been developed which will provide the desired suspension of dust for these studies.
- (o) The problems concerned with the use of radioactive dust from target vessels in connection with gastro-intestinal absorption problems are being complicated due to the fact that the most active dust available to date has an activity of 1.4 microcuries per gram. Chemical analysis of the dust reveals that the major portion consists of ferric oxide. It appears that the chemical toxicity of the dust itself may cloud the proper evaluation of the radiological effects. Further study of this problem is underway.
- (p) The physical properties of the dust to be used in the study of skin contact exposure with radioactive dust have been determined. Information obtained includes self-absorption curves and the determination of the maximum energy of the beta particles emitted.
- (q) Library research was continued in connection with the development of autoradiographic techniques. Upon the arrival of radioactive isotopes, it is expected that this program will provide a very valuable source of scientific data.
- (r) Work continued on the development of the automatic beta activity scanner. By adjusting the exposure area of the beta counting tube, sample activities ranging from background to 50,000 c/m can be handled without coincidence corrections. Calibration factors for all exposure areas have been established by the scanning of known beta standards.
- (s) It has been noted in MDDC No. 417 that in the determination of long-lived radioactive dusts, a correction must be made in the collected sample for the presence of active materials found in the atmosphere due to natural radon and thoron content. This is an important and trouble-

some conversion when determining low air activities. As much as 2.5×10^{-3} microcuries of combined radon and thoron in a single filter collection has been obtained during preliminary tests. From calculation of decay rates, the final long lived activities can be determined if decay is checked 6 and 24 hours after collection. If this is not done, samples must be aged for four days. The magnitude of retention of radon and thoron in canisters (charcoal canisters) is being investigated.

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Radiation Laboratory Medical Monthly Progress Report for January 1948.

I. SUMMARY OF ACTIVITIES OF THE RADIOLOGICAL HEALTH SECTION

(A) Radiological Safety

(1) Physical Examinations

- (a) 24 initial physical examinations and 100 recheck examinations were made by the Radiological Safety Health Officer at this activity.

(2) Inspections

- (a) Weekly inspections of all radiological facilities were conducted from the standpoint of radiological safety. No major discrepancies were noted.

(3) Facilities

- (a) The change house on the first deck of building 507 is in full operation and is found to be eminently satisfactory.
(b) Other temporary housing facilities for laboratory spaces etc., are adequate.

(4) Lectures

- (a) Lectures on Radiological Safety have been given once a week to shipyard personnel who are directly concerned with shipboard radiation hazards.
(b) Dr. Petrakis is temporarily assigned to the duties of the Radiological Safety Health Officer during Dr. Carlson's leave period.

(B) Dosimetry

- (1) 248 film badges were developed during the month of January. No exposures in excess of tolerance to Beta and Gamma radiation were noted.

(C) Clinical Radiochemistry

- (1) Analysis was made on a flour sample showing high activity from the USS PENSACOLA.

- (2) Comparisons of various methods for analysis of plutonium and fission elements in biological material continued. Accuracy and applicability of the methods are being studied.

(D) Training

- (1) Mr. Shapiro (Biologist P-3) continued a series of lectures on electronics.

- (2) Mr. Marshall presented a lecture series on spectroscopy and spectrophotometry.